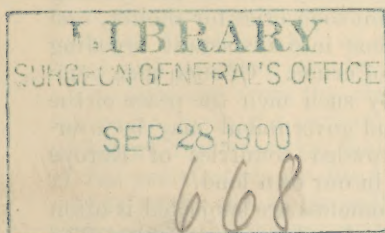


Vaughan.



HEALTHY HOMES.

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The condition of the homes of a nation forms the best index to its rank in civilization. In healthy, happy homes there will always be found good citizens. Great, indeed, must be the provocation which will lead the owners of pleasant dwellings to any revolutionary measures. The ideal government is that where every citizen has a pleasant and healthful place of abode. The State should encourage its citizens in building for themselves permanent places of residence. Employers should endeavor to give their honest employes a sense of security in their positions, and, if possible, a proprietary interest which will attach the laboring man to his work. If a pleasant home receives the working man when his day of labor is finished, he will be contented and happy. He will hasten to that home and there remain until duty calls him away. The capital which employs his labor will thrive. The community in which he lives will be improved by his residence in it. The State will have in him a patriotic son, and his life will add to the material resources of the State. He will be interested in education, and dying he will leave intelligent sons and virtuous daughters.

On the other hand, if the home of the working man is filthy, filled with foul air, impregnated with smoke and noxious gases, and if in this place dwells his sickly family, so that he has not where to rest his weary body in peace, he

shuns that home. He spends his idle hours in saloons and other places of vicious resort. The hard earned money goes for drink and at the gaming table. Poverty becomes more grinding, naked want soon cries for shelter, and gaunt hunger begs for bread. Discontent deepens into a constant brooding over the ills of life, and desperation leads to acts of crime. Of such men communistic and nihilistic societies are formed. By such men the peace of the community is disturbed, property is destroyed, and government may be overthrown. These are evils which all the overcrowded countries of Europe have felt, and which are not altogether unknown in our own land.

Again the promiscuous crowding to which the homeless are subjected is often most disastrous in its effects. The privacy of the family is impossible. The good and bad are mingled until all are alike bad. Virtue sits by the side of vice until the former becomes as vicious as the latter. Old wickedness trains young innocence until the pupil surpasses the teacher in immorality. Love for the State is forgotten; regard for the rights of others is overlooked; and respect for self is lost. The clean and the filthy become alike unclean. In this soil the seeds of disease find abundant nourishment and death reaps a rich harvest.

Fortunately the resources of this country are so great that any man with health and energy can secure for himself a comfortable home. As the rich have learned architects to plan, and skillful workmen to build their costly residences, I shall confine this paper to a discussion of the dwellings of the laboring classes. Every working man should strive to own a healthy home. A cottage may be as perfect in its sanitation as a palace. Indeed, the advantage is often in favor of the former, since the elaborate ornamentation of the latter may serve as a harbinger of dirt and disease.

LOCATION.

The location of the home of the working man is often determined by conditions over which he has no control. The price of land, the distance from place of work, and the ease of access cannot be disregarded. However, certain facts must not be ignored in the selection of a site for a home. In the first place the soil must be healthy, or must be rendered healthy, before the building is erected. Certain soils are hot-beds in which disease producing conditions are constantly grown. The unhealthfulness of localities has been recognized from remote times. For instance, the old Latin author, Vitruvius, in his *De Architectura*, states that the inhabitants of the city Salpia were compelled on account of the continued prevalence of malarial fever, to leave their city and to rebuild upon higher ground. The old Millbank prison of London was never freed from malaria, although much money was spent in sewerage. Instances of this kind might be multiplied indefinitely. On the other hand, the healthfulness of certain localities is proverbial. The freedom of Lyons, France, from cholera is said to be so well known that during the prevalence of cholera in France, thousands of people go from Paris, Marseilles, and other cities, to Lyons. This is true notwithstanding the fact that Lyons is an industrial city with its atmosphere laden with dust and smoke. Its exemption from cholera is supposed to be due to the fact that it stands upon a granite soil. Not only do different cities vary in their healthfulness, but there are marked variations in different parts of the same city, and in different houses on the same street, even when these houses are supplied with the same water and furnished with identical sewerage facilities.

A soil which is moist and which contains much organic matter is invariably unhealthy. Low and imperfectly drained lands have, from the remotest times, been regarded as undesirable places of residence. The same is true of the so-called "made earth" of our cities, where water-courses, arms of bays and lakes and marshes have been filled up. Such fillings are usually made with ashes, scrapings from the street, and all kinds of refuse from back yards. In the made earth the organic matter putrefies and gives off poisonous gases which are drawn into the houses and breathed by the inmates. Other products of this putrefaction are dissolved by the water percolating through the soil, and probably collected in the wells from which drinking water is taken. Thus the air breathed and the water drank by persons dwelling in houses built upon such soil, are both likely to be poisonous.

A healthy soil contains no animal refuse, and at most only small amounts of vegetable matter. If a bit of such a soil be broken in the hand and tested by the sense of smell, it will be found to have no unpleasant odor. On the other hand the process of decay and putrefaction in polluted soils may be recognized by their disagreeable odors. These are best detected by heating gently a handful of the earth. If animal matter be present, ammonia will be evolved on heating the soil with potassium hydrate.

About one-third the volume of the soil is air. This ground air bears from the soil the gaseous products arising from the decomposition of organic matter. If a house be built over a polluted soil and no precautions be taken to prevent the entrance of ground air, the currents will be established by the difference in temperature between the air of the room and that contained in the surrounding soil. Transitions in atmospheric pressure and the velocity of winds also effect the movements of the ground air.

Even when the building is placed upon an uncontaminated soil, it should be an invariable rule to place beneath the floor a layer of cement impenetrable by gases.

THE CELLAR.

Every house, even if it be one of only one room, should, in this latitude, have a cellar extending under every part of it. I am sure that one of the most favorable conditions to the development of consumption is residence in a house set down on damp ground. Even if this dreaded disease is escaped, the dwellers in such houses are frequently subjects of malarial fevers, dysentery, and rheumatism in its various forms. The construction of the cellar should be carefully attended to, even if its cost necessitate the omission of ornamentation in the superstructure. The excavating should extend out in all directions, at least one foot beyond the line on which the walls will stand. Then, after the walls have been built, this space should be packed with gravel or cement. This will aid in turning the rainfall from the walls and in keeping the cellar dry. The walls, if of brick, should be double, with an intervening air space of at least two inches, the outer and inner walls being tied together by an occasional brick placed crosswise. This will prevent the walls from becoming saturated with moisture. If of stone, the walls should be at least two feet in thickness. The walls should extend far enough above ground to allow sufficient space for windows. If this is impossible there should be sunken areas in front of the windows. The windows should be hung on hinges, so that they can be easily thrown open for ventilation of the cellar. As a rule cellar windows are firmly nailed in place and are not open for years. The cellar floor should be of the best Portland cement or asphalt, not less than six inches in thickness. If the

underlying soil is damp, it should be drained with agricultural tile, which should pass under the walls into a large tile passing around the house and conducting the water into some suitable receptacle. If the cellar is to be used for different purposes, for a furnace or storage of fuel and vegetables, it should be divided into compartments, to modify the temperature. The care of the cellar should not be neglected. Decomposed vegetables should not be allowed to accumulate in it to vitiate the air of the rooms above. It should not be made the repository of old shoes, tin cans, and other rubbish. It should occasionally know the presence of the broom and the whitewasher's brush.

THE WALLS OF THE HOUSE.

The walls of the house, if of brick, should be double. Besides, the plastering should not be placed directly on the bricks. The inside of the wall should be furred, with scantling nailed to the furring, and then lathed. With hollow and furred walls two air spaces are secured, and moisture will never penetrate such walls. On the other hand, if the brick walls are solid and the plastering be placed directly on the brick, the walls will be constantly damp, and the rooms will have a musty odor, it matters not how busy the housewife may be in her endeavor to keep everything sweet and clean. Stone walls are built solid, but should be furred. Frame walls are always supplied with an air space. It has been proposed to fill these spaces with mineral wool. This would not interfere with the passage of air, and would add to the fire protection, and also prevent these spaces from becoming the haunts of rats and mice. Healthy walls should be pervious to air and impervious to moisture. These conditions are fulfilled in the directions given above. The furnishing of the interior walls is a matter of no little importance. The plastered wall is still pervious to air, but as soon as it is covered with paper the passage of air through it is wholly prevented. The same effect is produced by oil paint. Indeed, there are many hygienic objections to the use of wall paper. The paste used slowly undergoes putrefactive changes. When a coat of new paper is demanded, the old is but partially removed, and in this way layer after layer accumulates. The paper may offer suitable hiding places for disease germs, where they will escape the action of disinfecting agents. Lastly, wall paper sometimes contains arsenical colors, and many authentic cases have been reported in which great detriment has been done to the health of persons by occupying rooms whose walls were covered with arsenical papers. These papers may be of any grade or any color, though the drab and green papers are most likely to contain arsenic. No one should use a wall paper without having it tested for arsenic. The test is easy of application and will be made for a very small fee by any intelligent druggist. Notwithstanding all these objections to wall paper, the fact that it forms an inexpensive and tasty decoration will continue its employment. When used, however, we should remember that the respiration of the house through its walls is prevented, and therefore we should provide all the more abundantly for artificial ventilation.

THE FLOORS.

The floors of the house should be well laid. The best floor for a residence is one of hard wood, laid with tight joints. When there are open seams between the boards, waste matter falls or is swept through the crevices, where it accumulates or forms food for mice and rats. Moreover, if the joints are not tight, the frequent scrubbing of the upper floors at least will be neglected for fear

of injuring the plastering of the ceiling of the room below. Carpets are great receptacles of dust. They should be frequently removed and thoroughly cleaned. For hard floors rugs are most suitable, and will not be allowed to accumulate filth to the extent that carpets do. While some covering makes a floor, especially in winter, more comfortable, a clean bare floor is much to be preferred to one covered with a filthy carpet. An inexpensive matting which can be thoroughly scrubbed with salt and water is now made, and is especially suitable for dining rooms. The yellow or Georgia pine is very suitable for the floors of kitchens and pantries.

ARRANGEMENT OF ROOMS.

The size and number of the rooms will depend upon the purse and wish of the owner. However, there are certain facts which should influence the arrangement of the rooms. The living rooms should be on the sunny side of the house. Men as well as plants need sunlight, and without it the best physical development cannot be attained. Especially should the rooms occupied by women and children, who are out of doors but little, be light and sunny. My professional work daily calls me into houses which are dark and damp. I never enter such a house without a sensation of chilliness. It matters not how luxuriantly such a house be furnished, it never looks cosy and cheery. The pale faces and rheumatic walk of the inmates convince us that such houses are not healthy, and without health they cannot be happy. How often do we find the sunny side of the house occupied by a long passage way or hall, while the living rooms lie on the northern and cold side of the house. Too often the frugal housewife shuts out every ray of sunlight for fear that it will fade the carpets. Some one has said with truth that "it is far better to have faded carpets than faded cheeks." The child which is but seldom bathed in the sunshine grows like the plant in the dark cellar, sickly and pale.

The long, dark, conventional hall should be done away with. In summer it becomes a kind of store-house for old hats, rubber coats, and umbrellas. In winter it is but imperfectly heated, and filled with cold draughts, through which the children run with a shudder. At all times it detracts from the comfort and ornamentation of the interior of the house. There may be houses in which it is useful, but then it should be well lighted and heated. It is better to have a stairway go up from a sitting-room or from a small vestibule.

It is the ambition of most American wives to have one room in which are collected the most showy of the household ornaments. This room is called the parlor. The small boy is taught to regard this room as forbidden territory. The air and sunlight are carefully excluded, and the room opens only to some honored visitor. The exclusion of the small boy may be all right, but the air and light should be regarded as the most honored of guests, and admittance even to this shrine should not be denied them, for they bring with them health and happiness, the greatest blessings granted to mortals.

It is unfortunately the fashion to make the bedrooms small in order to have a large sitting-room or parlor. The small size of bedrooms has become a fruitful source of injury to the health of individuals. No one who lies for from 6 to 8 hours in a small bedroom, with no provision for ventilation, can be perfectly healthy. Indeed there is really more need, if possible, of having the bedrooms large and airy than there is of giving like attention to the living rooms. The constant going in and out during the day removes some of the ill effects of want of proper space, and improves the air of the room by fresh currents when

the doors are opened; while during sleep one must breathe the air in which he lies. Basement and attic bedrooms are both highly objectionable. The former are always poorly supplied with fresh air, and are generally damp and musty. The latter are likely to be too cold in winter and too warm in summer.

If the owner can afford, at least one best room should contain a fire-place or grate; for with every attention to the laws of health, there must come times when some member of the family will be sick, and the sick room should be full of cheer. The open fire is most cheerful. Pleasant surroundings often aid the doctor's pills and potions in restoring the patient to health.

Probably the most important room in the house is the kitchen. Before you praise the housekeeping of any woman, visit her kitchen. The parlor may be a gem of beauty, the bed-linen may be spotless, the table may be covered with decorated china, but if the kitchen be filthy, all is in vain. The floor, which is best of hardwood or yellow pine, should be kept bare. At least two windows, one on each side, for the purpose of thoroughly airing the room occasionally, are desirable. The pantry should be large and well supplied with cupboards and shelves. The flour box should be so hung that it will close itself. It adds much to the comfort of the cook and to the cleanliness of the walls and ceiling of the room, if the stove or range be covered by a hood which conducts the vapors arising from the cooking into a flue in the chimney.

THE WINDOWS.

Every room should have direct sunlight and not be dependent upon that which is diffused through another room. The windows should extend well towards the ceiling and be hung so as to lower from the top as well as raise from the bottom. The blinds should be hung in such a manner that they are easily opened. In no part of the house should they be kept closed during the day.

HEATING AND VENTILATION.

Of all the methods of heating, the open fire is the most enjoyable; while the stove is the most economical. In the Northern States the open fire alone seldom furnishes enough heat during the coldest months of winter. Coal stoves should have no loose joints through which gases can escape. The mica doors must be kept in repair, the flue must not be allowed to clog, and attention must be given to the dampers. The most poisonous gas given off from burning coal is carbonic oxide. It is without odor, and whole families have been poisoned by it without being awakened. It combines with the substance of the red blood corpuscles, forming quite a stable compound, and thus preventing the oxygenation of the blood. Especial care must be exercised when coal stoves are placed in bed-rooms or in rooms which open into bed-rooms.

Makers of wrought iron stoves and furnaces will insist that gases pass more readily through cast iron, and for this reason their stoves are superior and free from danger; but a properly constructed and managed cast-iron stove is free from danger, and is in many respects superior to those made of wrought iron. One of the greatest objections is that in houses in which they are used there is usually no provision made for ventilation. However, a house heated by stoves may be as well ventilated as any other. In most dwellings there is unfortunately no special provision for ventilation, but the carpenter fits the windows, doors, and baseboards so poorly that much fresh air will come through the crevices. But if many occupy the room, the amount of fresh air which finds admittance through these channels may be insufficient. Especially is this

likely to be the case if the room is surrounded by other parts of the building, and consequently has but a small amount of surface exposed to the out-door air. Besides, the direct draughts from windows and doors are always unpleasant, and may seriously affect the inmates of the house. In order to remedy these defects, any one of a number of simple devices may be resorted to for the admission of fresh air. The simplest of them consists in fitting a piece of board from four to eight inches wide in the window frame directly in front of the bottom of the lower sash. This board may be finished to correspond with the wood-work of the room. With this board in place, and the lower sash slightly raised, two air vents in the window are established, one under the lower sash, the current of which is turned upward by the board, and the other between the upper and lower sash. Through the upper vent some of the foul air will escape, though the current through this opening is not invariably outward. Another plan consists in bringing a pipe about six inches in diameter through, and possibly under the floor, to the stove, where it terminates in a sheet-iron jacket placed around the stove, leaving a space of one or two inches, and having escapes only at the top. The heat of the stove will produce a strong current through the pipe, and thus plenty of fresh, warmed air is admitted to the room. The exact amount of air entering may be regulated by a properly constructed damper.

By any of the above mentioned or a number of other simple devices, a sufficient supply of fresh air may be admitted into a room heated by a stove; but some provision must be made for the exit of foul air. This should always be attended to in the construction of the house. For every room heated by a stove, there should be two flues, one for the smoke and other gaseous products of combustion, the other for ventilation. The latter should extend to the floor, just above which there should be a register. The partition between the ventilating and the smoke flues should be of brick placed on edge, thus making it as thin as possible so that the upper part of the ventilating flue will be thoroughly heated from the smoke flue; or the smoke flue may be of iron pipe placed in a large flue, and the space all around the pipe will serve as a ventilating flue. With this arrangement, the upper part of the ventilating flue will be heated whenever there is a fire in the stove, and the removal of the foul air will be rendered certain. It should be seen to in building the chimney that the inside of the ventilating flue is not clogged with mortar or pieces of brick.

With the plan recommended above, there is no reason why a room heated by a stove may not be so well ventilated that no disagreeable odor will be perceptible to the most sensitive person on coming in from the outdoor air, provided, always, that the room is clean. Unfortunately, however, the great majority of houses which are heated by stoves are built without the slightest provision for ventilation. In such houses fresh air may be introduced by the method already given; but the escape of foul air is more difficult to be provided for. It may be done, however, as follows: Place a pipe of tin or sheet iron, of from six to ten inches diameter, according to the size of the room, along the wall behind the stove. The lower end of this pipe extends to within a few inches of the floor and remains open, while the upper end passes by means of an elbow into the smoke flue below the point at which the stove-pipe enters. When the chimney begins near the ceiling, as it does in many inexpensive houses, the upper part of the ventilating pipe may be formed into a jacket and enter the chimney with the stove-pipe.

When the hot-air furnace is employed, certain precautions are desirable, both in regard to the heating and to the ventilation. Most people select a furnace

which is too small. They are led to do this on the score of economy or by the representations of ignorant dealers, who exaggerate the heating capacity of the the special furnaces which they sell. The result is that the heating is unsatisfactory. The fire must be crowded, the air enters the rooms overheated and excessively dry, soon the furnace burns out, and the intended economy turns out to be ignorant waste. The furnace should be large enough. Proper encasing should prevent the escape of heat into the cellar, where it would not only fail to avail anything in the way of heating the rooms, but would destroy the value of the cellar as a storage room for fruits and vegetables. The air which is to be heated must under no consideration be taken from the cellar. It must be brought directly from outdoors. The conductor should be of metal, or it may be a wooden box with a metallic lining. It should not be possible for any cellar air to enter it. Its outer opening should not be near any cesspool, privy-vault, or other source of air contamination, and it should be protected from the introduction of solid particles by a wire screen. The air chamber of the furnace should contain water to prevent excessive dryness of the air. The horizontal hot-air conductors should be as short as possible. Otherwise the draught will all be through the vertical pipes; or we may say that the ascent of all the hot-air conductors should be as nearly the same as is possible. The hot-air registers should be placed in the baseboard and not in the floor; for when the latter place is selected, all kinds of refuse falls through the register, or is thrown down into it.

With a properly selected and arranged hot-air furnace, the ventilation and heating of a house may be made good, provided there is ample arrangement for the removal from the rooms of the foul air; but this is a *sine qua non*. Every room heated by hot-air must be provided with a foul-air shaft. In order that there may be a constant draught in this foul-air duct, it must be heated. If there be an open fire in the room, the flue for this will act as a foul-air shaft. Otherwise such a shaft must be provided. There must be a flue for each room. Too often the attempt is made to ventilate two or more rooms by one flue. The result is that the bad air of one room passes into another, or there is no draught at all, and consequently no ventilation. These foul-air flues may be heated economically by grouping them about the furnace smoke-flue, or in large buildings where steam is used for heating by collecting several of these flues around a steam coil placed in the attic.

WATER SUPPLY.

It is unnecessary for any one at this time to enlarge on the great dangers to health that lie in impure water. It is a well recognized fact that many infectious diseases, such as typhoid fever, cholera, dysentery, scarlet fever, and diphtheria are often spread by means of impure drinking water. I shall therefore confine myself to giving some plain direction for securing drinking water which will not endanger health. The sources of drinking water are as follows:

1. Cistern water.
2. Surface water.
3. Subterranean water.

Cisterns in this country, as a rule, consist of underground reservoirs. The condition of this kind of water depends on the air through which it falls, the roof upon which it falls, and the kind of cistern. In manufacturing towns dust and other impurities are brought down with the rain. The conductors which convey the water from the roof to the cistern should be supplied with means for

turning off the first part of the rainfall. When this is done, the impurities from the air and roof are gotten rid of. Especially is this desirable if the roof be of wood and old; if there be on it leaves and other debris from the projecting branches of trees, or if there be any probability of birds depositing their excrement on it. The cistern should be so constructed that the soakage of water from the surrounding soil into it is impossible. The walls should be of brick, laid in water lime, and should be plastered on the outside as well as on the inside. The top of the cistern should be covered by a box extending several feet, and over this there should be a fine wire net. In this way the space above the water will be supplied with good air. Under no consideration should the cistern be placed under the house. When this is done the water is constantly covered by a layer of impure air, and the cleansing which should be done annually at least is not so likely to be attended to. Wooden pumps should not be used. They soon decay, collect about themselves much filth, and are not economical. The best arrangement is to have an iron pipe leading from a cistern to a pump in the house.

It is customary in some places to put an overflow pipe from the cistern to a cesspool or privy vault. This has, I have no doubt, cost many lives. In some instances which I have examined these pipes have had no traps; in others the traps have been rendered useless by siphonage or evaporation. Gases arising from putrefaction in cesspool or vault pass into the cistern, and liquids have been known to do the same. There should be absolutely no connection between the cistern and any receptacle of filth.

However much care may be exercised in the collection and storage of cistern water, it should be filtered before it is used. Many cheap and fairly effective charcoal filters are in the market. They remove suspended matter and to some extent, on account of the oxygen condensed in the pores of the charcoal, oxidize the organic matter which is held in solution. A filter which is kept constantly submerged soon ceases to be of value. If any epidemic prevails, all drinking water, it matters not what its source, should be boiled. After being boiled it may be passed simply through filter-paper, but a new sheet of paper should be used each day.

The purity of surface water will depend on the condition of the soil on which it falls and over which it flows. That which falls on and flows over a filthy soil should not be used for drinking purposes, save in case of necessity, and then it must be boiled before it is used. The water collected in shallow wells is really surface water, and that often of the worst kind. It is a widespread delusion that filtration through a few feet will purify any water. Indeed, by this filtration the water often becomes more thoroughly contaminated. In a soil impregnated with organic matter, putrefaction is constantly going on, and many of its most poisonous products are freely soluble in water. In a small back yard we often find a privy vault, cesspool, and shallow well, all in close proximity. By this arrangement man often drinks his own excretions, and then when typhoid fever or other disease strikes him down, wonders for what cause Heaven sends such a calamity on him. That there is a certain degree of purification in running streams, there can be no doubt; but notwithstanding this, specific poisons have been carried long distances in streams and have still manifested their poisonous properties.

Whether subterranean waters are pure or not depends much on the geological formations in which they exist. The source of the water must be below rock or thick beds of clay to escape contamination. The walls of deep wells should

be so constructed as to prevent soakage into the well from near the surface. Otherwise they may be as dangerous as shallow wells.

In concluding my remarks about drinking water, let me say that if it is at all suspicious, boil it.

THE DISPOSAL OF WASTE.

One of the most important questions in sanitary science is the disposal of waste matter. The health of every living thing, be it plant or animal, is injured if its own excretions be allowed to accumulate about it. This is true even of the minute pathogenic germs about which we have heard so much of late. It is likewise true of man. Such accumulations collected upon and in the soil poison the air we breathe and the water we drink. The activity of many of the ptomaines, poisons arising from putrefaction, surpasses that of any other toxic agent with which we are acquainted. Many of the older cities have become so thoroughly saturated with filth that cholera and other infectious diseases thrive in them.

The disposal of human excrement deserves more care than that of any other waste. In cities where there is an abundant public supply of water, and where sewers are properly arranged, the water closet is the most convenient method and it may be made perfectly safe. Where water closets are used, the so-called separate system of sewerage is desirable, for reasons which are perfectly well known to my hearers. But with the most perfect system of sewerage certain precautions in the arrangement and care of the water-closets are desirable. In the first place water-closets should not be placed in bed-rooms or living-rooms, nor in rooms connected with these. They should, if possible, be located in some detached part of the house. The kind of closet should be determined by some competent person. Changes and improvements in the patents are constantly being made, and any preference that might be given here, probably would not apply three months from this time. The flushing tank for the closet should not in any way be connected with the drinking water supply. The closet should be well trapped, and the trap should be placed where it can be examined any time without tearing up the floor or breaking into the wall. The soil should have no connection inside the house at least with any other waste-pipes, such as those from stationary wash-bowls and from bath-tubs. The ventilation of the soil pipe should be by means of another pipe extending above the roof and not opening near any window.

Where there is no system of sewerage the dry-earth closet is the best means of disposing of human excrement. Indeed, upon sanitary grounds, the dry-earth system is in many respects more desirable than the water-closet; but the former requires possibly more care than the latter. Economically, also, the dry-earth system will prove the better when it comes into more general use, and the excrement is used as a fertilizer. A dry-earth closet properly kept is free from all noxious gases, and there is no possibility of the drinking water being contaminated by it.